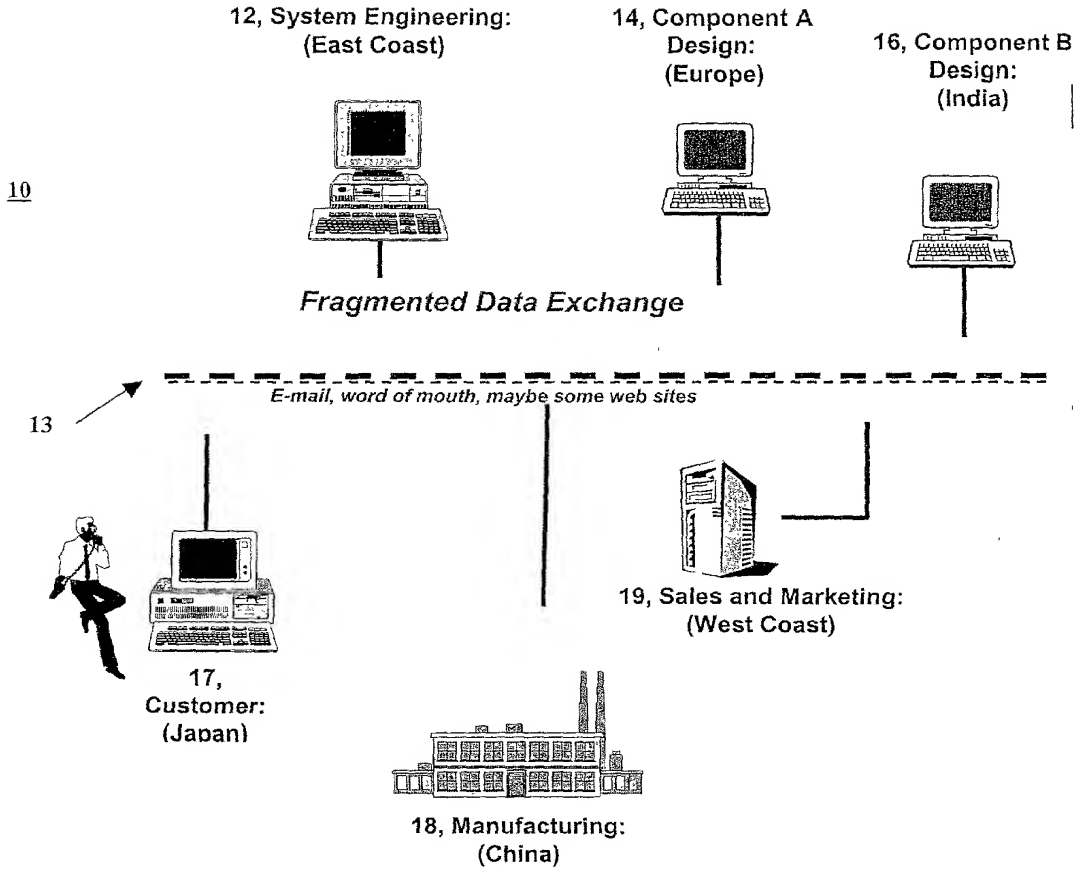

PRIOR ART

FIG. 1

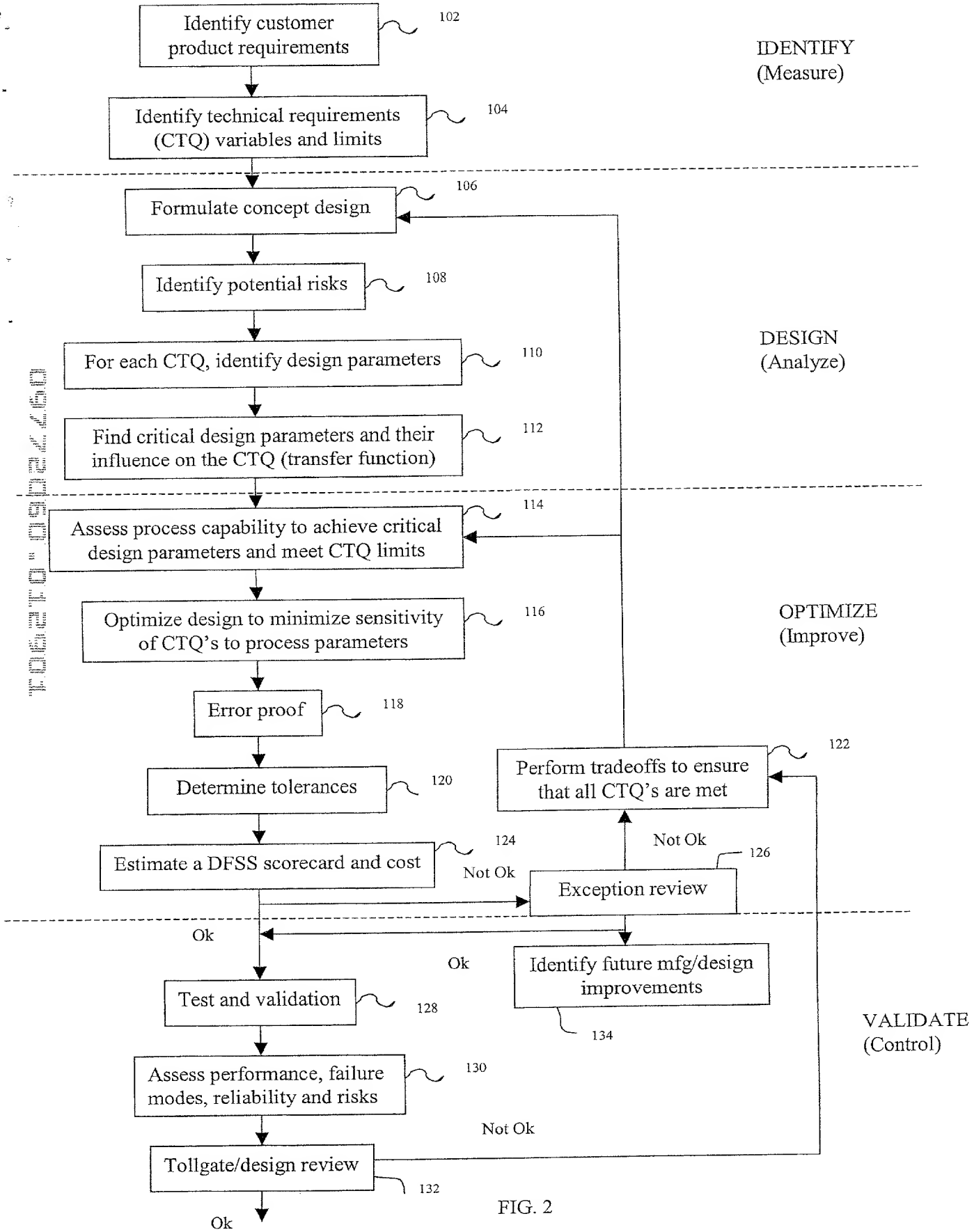
Identify customer product requirements
102
IDENTIFY (Measure)
Identify technical requirements (CTQ) variables and limits
104
Formulate concept design
106
Identify potential risks
108
DESIGN (Analyze)
For each CTQ, identify design parameters
110
Find critical design parameters and their influence on the CTQ (transfer function)
112
DESIGN SYNTHESIS
Assess process capability to achieve critical design parameters and meet CTQ limits
114
Optimize design to minimize sensitivity of CTQ's to process parameters
116
OPTIMIZE (Improve)
Error proof
118
Determine tolerances
120
Perform tradeoffs to ensure that all CTQ's are met
122
Estimate a DFSS scorecard and cost
124
Not Ok
Not Ok
126
Exception review
Ok
Ok
Identify future mfg/design improvements
134
Test and validation
128
VALIDATE (Control)
Assess performance, failure modes, reliability and risks
130
Not Ok
Tollgate/design review
132
Ok

FIG. 2

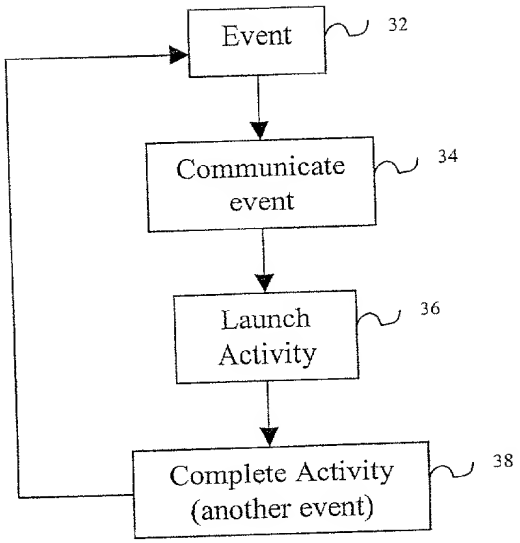
Event
32
30
Communicate event
34
Launch Activity
36
Complete Activity (another event)
38

FIG. 3

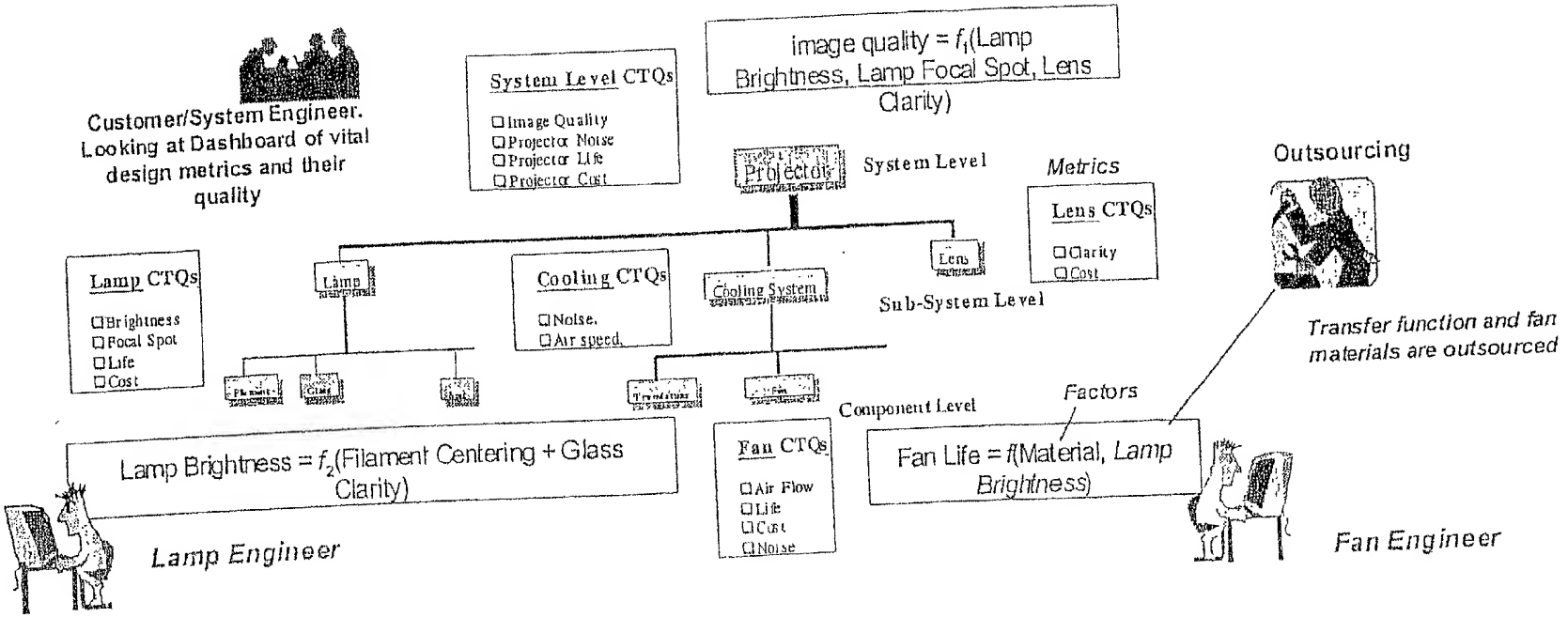
Customer/System Engineer. Looking at Dashboard of vital design metrics and their quality
System Level CTQs
Image Quality
Projector Noise
Projector Life
Projector Cost
image quality = f_1(Lamp Brightness, Lamp Focal Spot, Lens Clarity)
Projector
System Level
Metrics
Lens CTQs
Clarity
Cost
Outsourcing
Lamp CTQs
Brightness
Focal Spot
Life
Cost
Lamp
Cooling CTQs
Noise.
Air speed.
Cooling System
Lens
Sub-System Level
Transfer function and fan materials are outsourced
Component Level
Factors
Lamp Brightness = f_2(Filament Centering + Glass Clarity)
Fan CTQs
Air Flow
Life
Cost
Noise
Fan Life = f(Material, Lamp Brightness)
Lamp Engineer
Fan Engineer

FIG. 4

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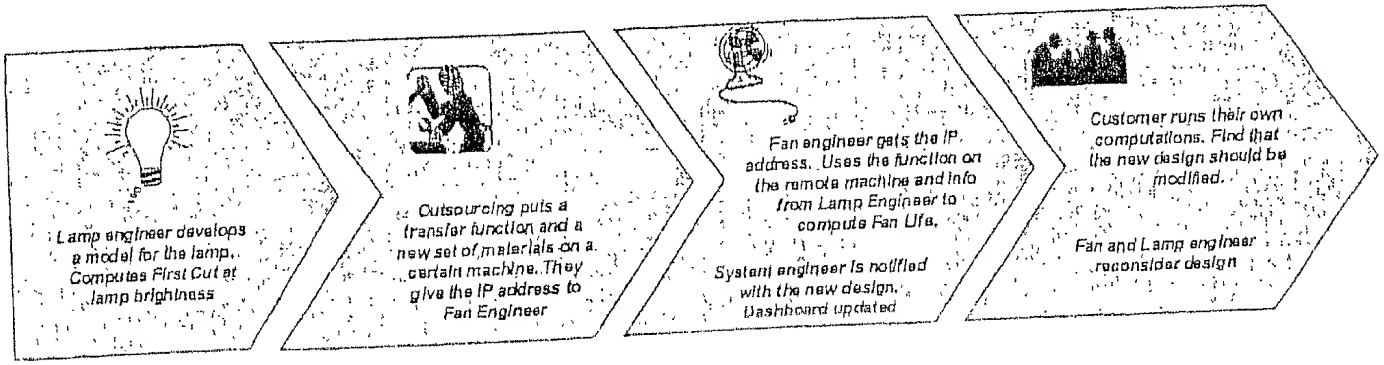


FIG. 5

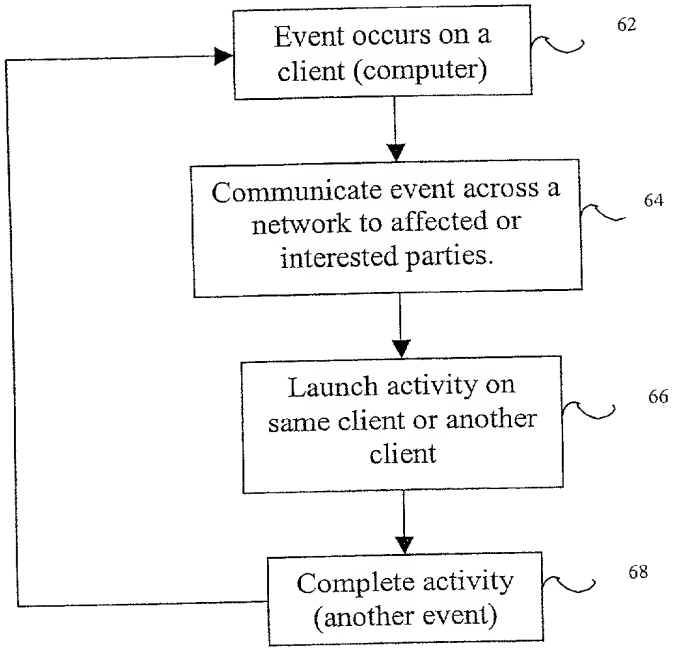
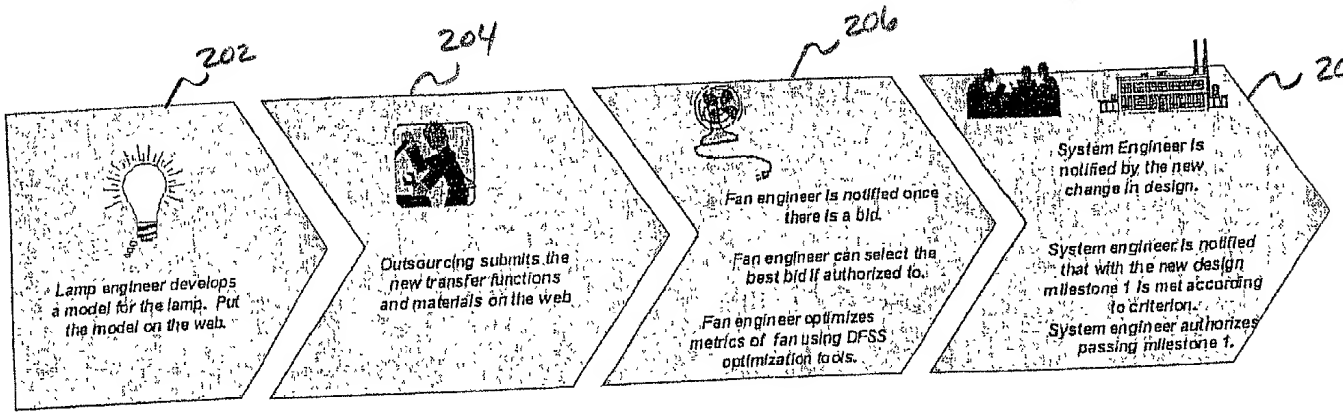
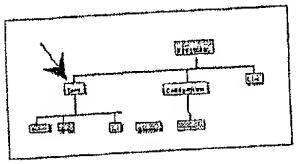

Event occurs on a client (computer)
62
Communicate event across a network to affected or interested parties.
64
Launch activity on same client or another client
66
Complete activity (another event)
68

FIG. 6



Lamp Engineer
Double Click on the lamp part on the html file shown on the web browser



Submit the new model, its wrapper, its location on the network. Submit the modified value of lamp brightness.

System automatically checks for authorization.

Lamp Engineer can get at the same site past best models and associated hints.

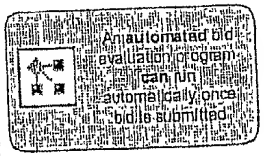
Outsourcing
Double Click on the Transfer function part of the fan subsystem html file shown on the web browser

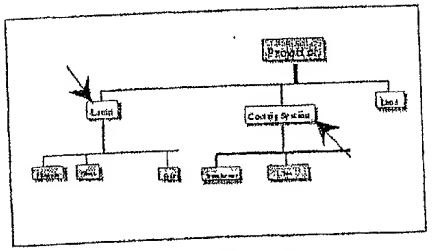
203

Submit the new transfer function.

Submit metrics of the new materials and their quality.

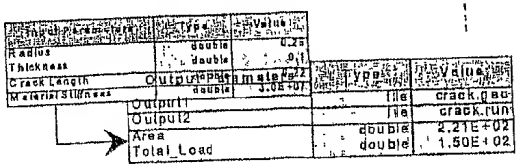
Cannot double click or access any other part of the system.





Fan engineer can access the lamp subsystem to get the newest lamp brightness metric (which was already automatically updated on the system)

Fan engineer can run the model submitted by outsourcing using the DFSS analysis integration tool.



Dashboard is updated automatically.

Factory is notified with the new designs.

Sensors in the floor continuously relay manufacturing capability and quality data to a database so that engineers can optimize using the most recent capability.

FIG. 7

Top Level Process: A

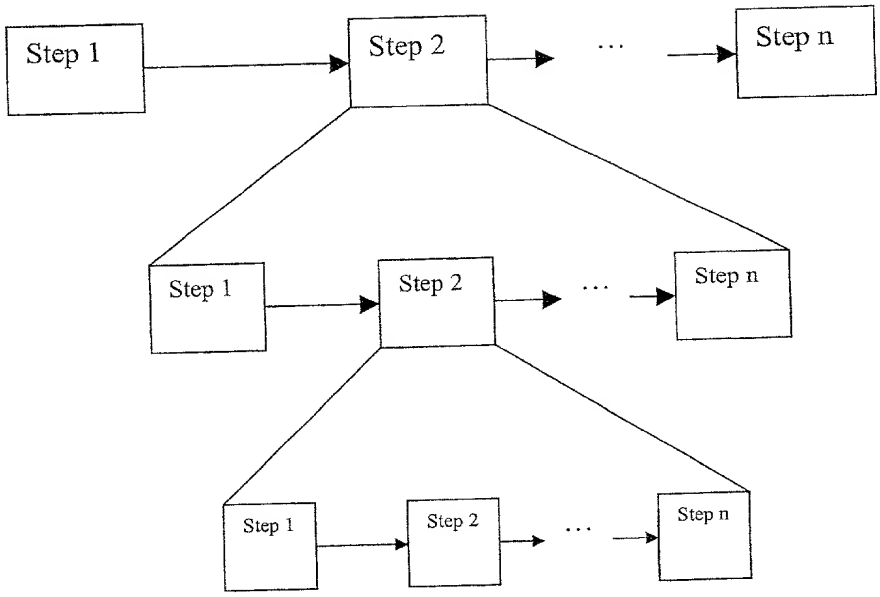


FIG. 8

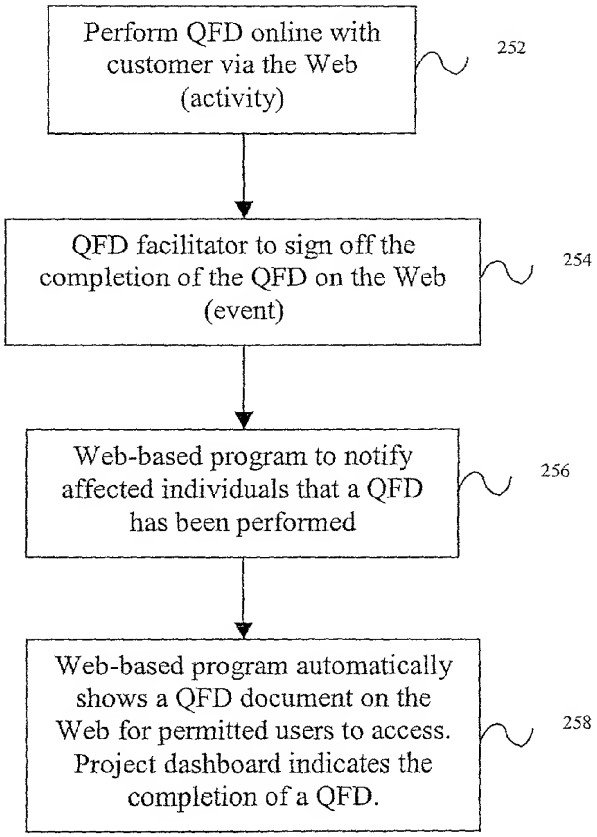

Perform QFD online with customer via the Web (activity)
252
QFD facilitator to sign off the completion of the QFD on the Web (event)
254
Web-based program to notify affected individuals that a QFD has been performed
256
Web-based program automatically shows a QFD document on the Web for permitted users to access. Project dashboard indicates the completion of a QFD.
258

FIG. 9

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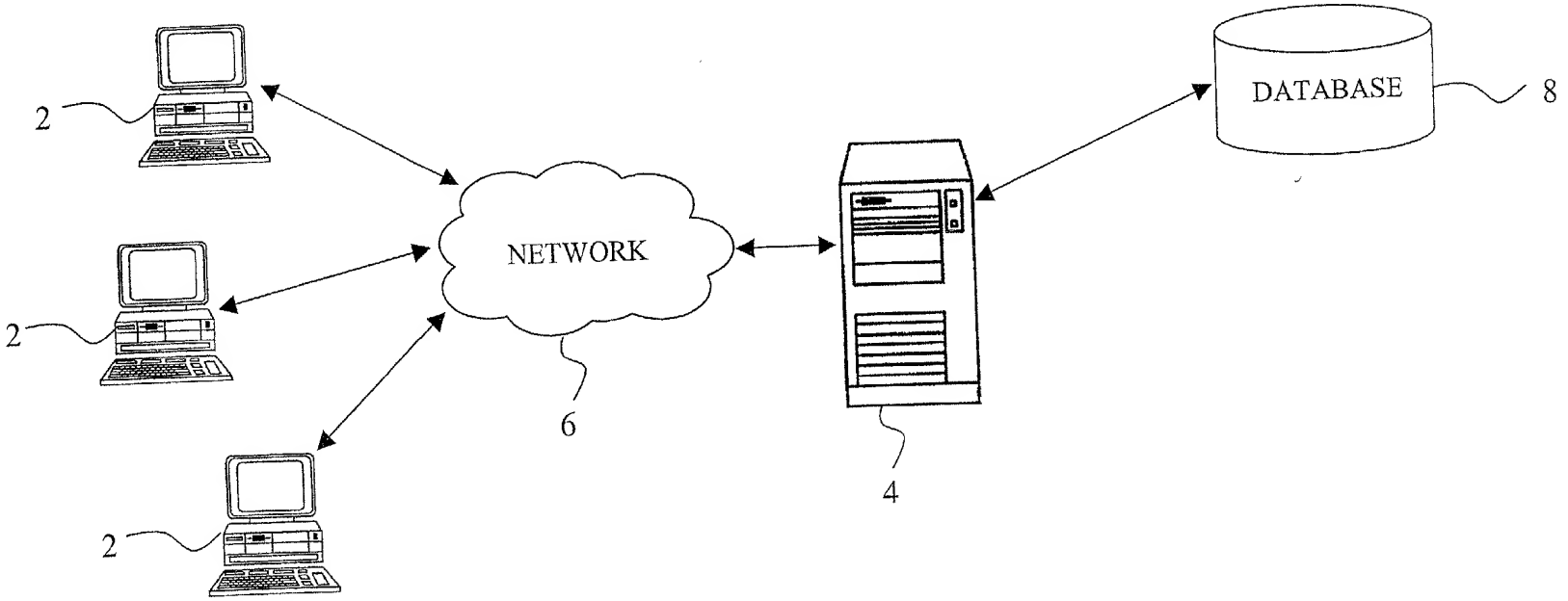

FIG. 10

Doc Code: IDS
Doc Description: Information Disclosure Statement (IDS) Filed

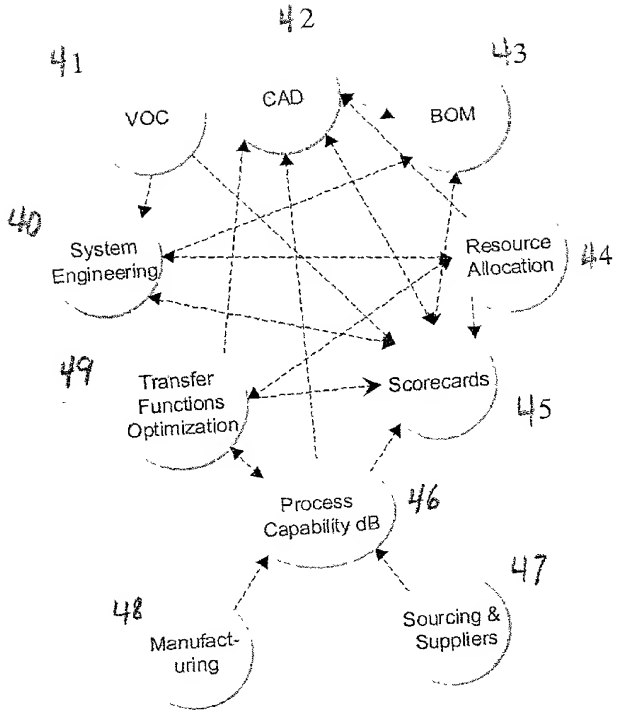

FIG. 11

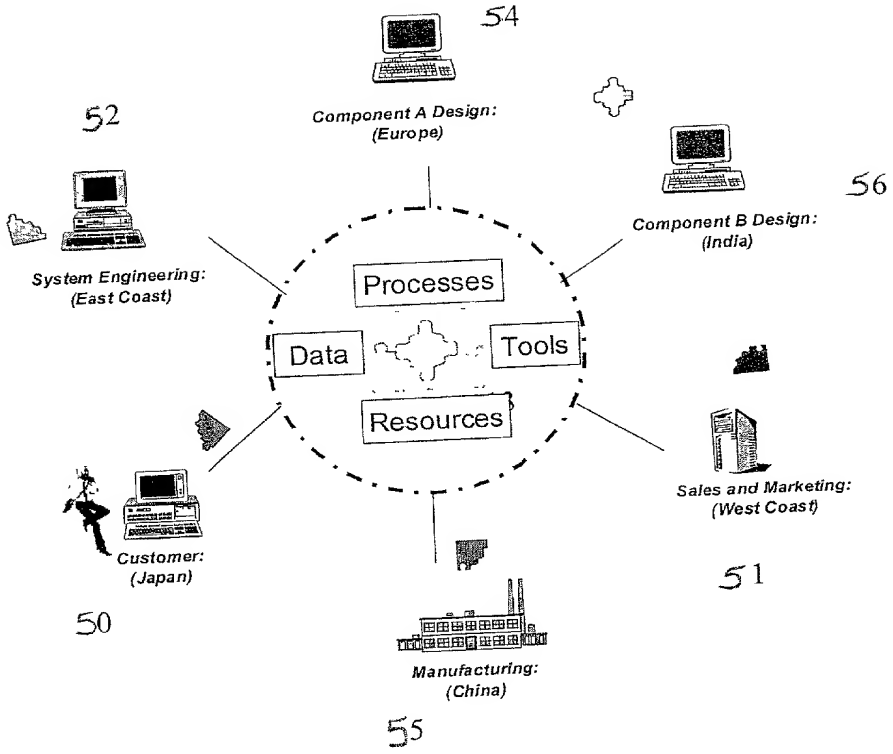
54
Component A Design:
(Europe)
52
System Engineering:
(East Coast)
Component B Design:
(India)
56
Processes
Data
Tools
Resources
Sales and Marketing:
(West Coast)
51
Customer:
(Japan)
50
Manufacturing:
(China)
55

FIG. 12

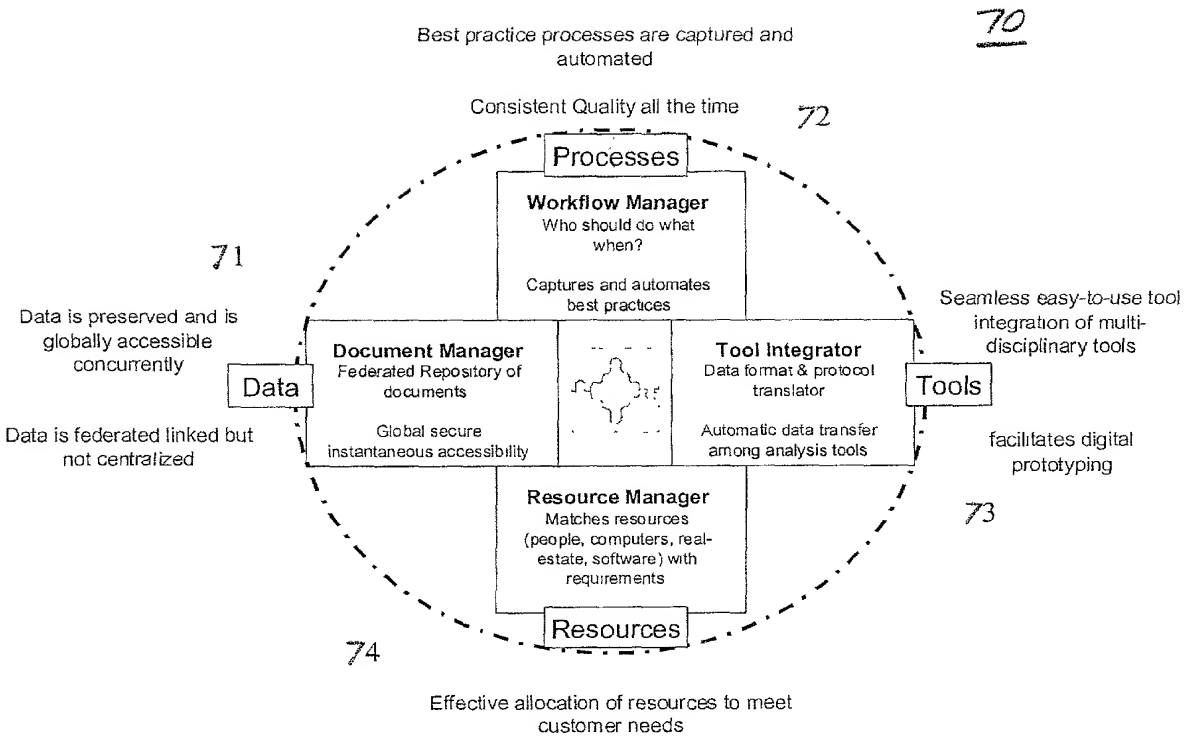
70
Best practice processes are captured and automated
Consistent Quality all the time
72
Processes
Workflow Manager
Who should do what when?
Captures and automates best practices
71
Data is preserved and is globally accessible concurrently
Data
Data is federated linked but not centralized
Document Manager
Federated Repository of documents
Global secure instantaneous accessibility
Tool Integrator
Data format & protocol translator
Automatic data transfer among analysis tools
Tools
Seamless easy-to-use tool integration of multi-disciplinary tools
facilitates digital prototyping
73
Resource Manager
Matches resources (people, computers, real-estate, software) with requirements
Resources
74
Effective allocation of resources to meet customer needs

FIG. 13

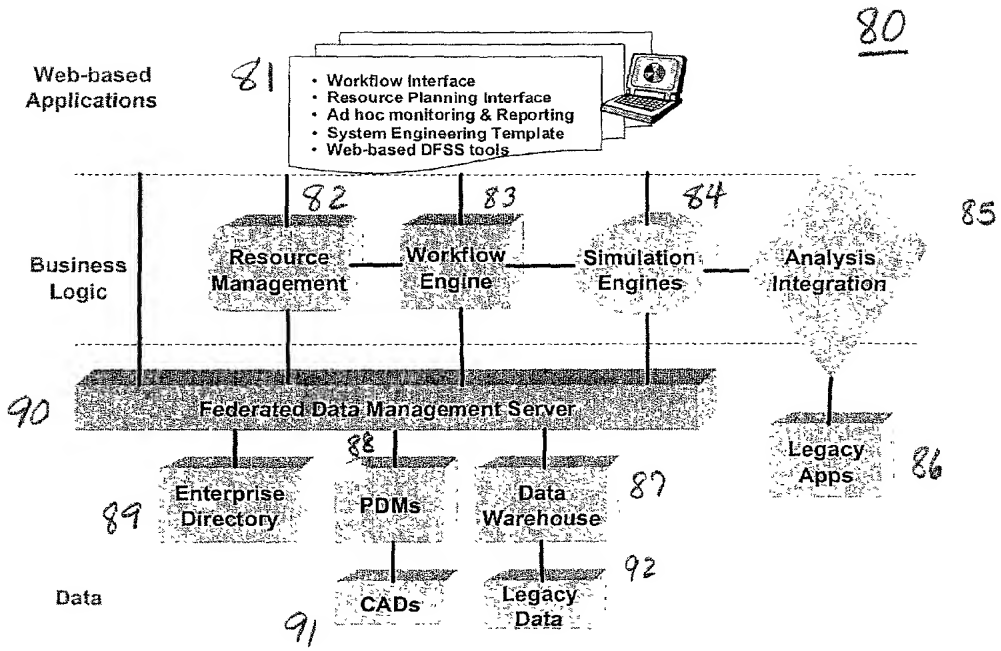

FIG. 14

Docket No. 2005P15950US

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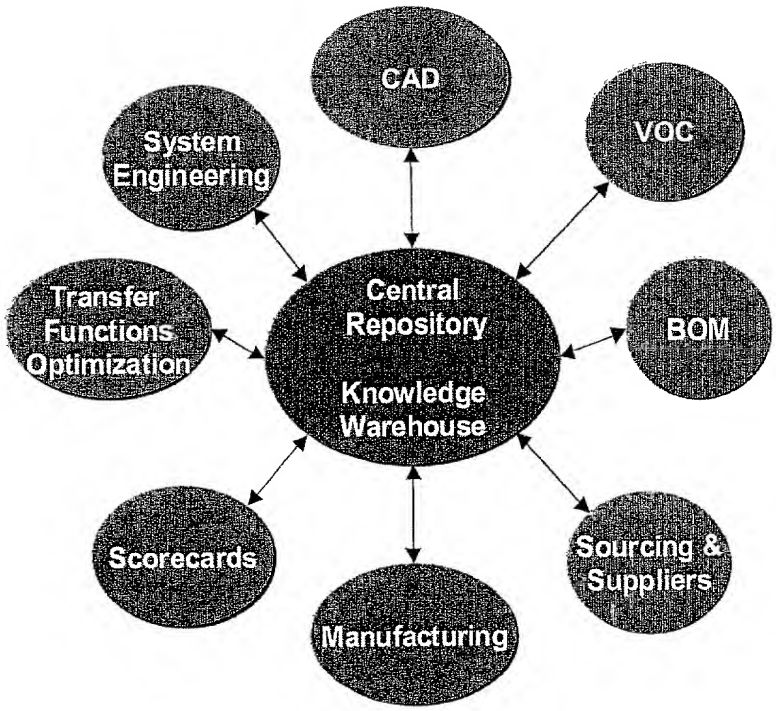

FIG. 15